U2730-1
5/10/90

Louisiana Energy Indicators

Center for Energy Studies
Louisiana State University

Fall 1988

TAXING NATURAL GAS

James H. Richardson, Ph.D.
Director, Public Administration Institute
Louisiana State University

Louisiana imposes a severance tax on natural gas severed within Louisiana's taxing jurisdiction equal to 7 cents per thousand cubic feet (MCF). Lower rates apply to specifically defined incapable wells. The volume tax on natural gas (cents per MCF) is in contrast to the 12.5 percent value tax on oil and condensate produced in the State.

Louisiana's volume tax on natural gas is also in contrast to the direct taxation of natural gas by other major gas producing states. Texas levies a 7.5 percent of wellhead value on natural gas. New Mexico utilizes a volume tax adjusted each year for inflation. Finally, Oklahoma imposes a 7 percent of wellhead value tax.

Louisiana has retained the MCF tax for several reasons. First, the federal regulation of interstate natural gas prices over the last forty years has created price discrepancies between in-state users and out-of-state users of Louisiana's natural gas. A value tax on natural gas would have penalized in-state natural gas users. Second, the tax should be on wellhead value, but natural gas is typically not bought or sold at the wellhead.

Wellhead value is a derivation of the selling price of the gas, less transmission charges, less any other processing charges incurred between its extraction and its commercial transfer. These transmission and processing charges can be difficult to verify without substantial auditing of the natural gas companies by the State. Hence, tax administration can be complicated.

Value Tax Preferred Method

A value tax on natural gas, however, is the preferred method of taxation among the other states, and **Louisiana, as it attempts to implement long-term amendments to its overall tax structure, should consider replacing the volume tax with a value tax.** Federal regulation of the natural gas markets has diminished significantly since the 1970's so price differentials among natural gas markets are based on non-regulatory factors. Artificial price discrepancies between in-state and out-of-state users of natural gas are diminishing, making this argument for a volume tax less relevant.

A volume tax suggests that the value of the resource never changes or that the State has no reason to share in the rising value of the resource. Natural gas is one of the State's resources that is being depleted. As a result, the State should recoup some of its permanent resource loss through the severance tax. The State should share in both the production of the resource and the value of that production.

Tax Burden

Even if the wellhead value of natural gas is the preferred tax base, the economic impact and administrative costs should be fully considered prior to any change. The economic impact centers around the issue: **Can a tax on natural gas be passed on to the final consumer?** The answer is, probably not. One state, such as Louisiana, does not now and never will control the price of natural gas. Louisiana producers are not price makers, but price takers. They can charge their customers what the global energy markets say is the going price. If they charge more, their customers will find alternative suppliers.

Louisiana's gas producers cannot hike their prices to end users. This is certainly the case in a depressed energy market, but also in the case of a more prosperous energy environment. Producers will always charge the highest price possible. A higher severance tax rate in a single state will not change the world price. If severance taxes cannot be passed forward to consumers, then they must be passed backward to producers, developers, explorers, or mineral owners. Contractual relationships link together the suppliers of energy resources.

In the long run, severance taxes will be shifted back to the owners of the mineral rights as much as possible. However, in the short run, contractual obligations between mineral owners, producers, and users will prevent an increase in the severance tax from being immediately shifted back to the landowner. The producer or the user will initially absorb the higher severance tax due to contractual commitments. However, changing from volume to value would not immediately mean more tax revenue for the state; although, over time, as the price of natural gas rises, the state would collect additional revenues. The long-term impacts on production and use of natural gas are minimized by the internal shifting of the tax burden to the least mobile resource owner. The

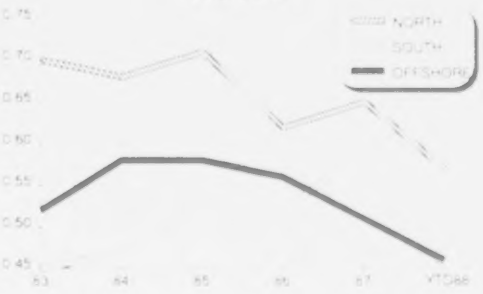
Continued on back page

Drilling

EXPLORATORY WELLS DRILLED

WELL COMPLETION SUCCESS RATIO

LOUISIANA



LA. RUNNING RIGS

Hughes Tool Co

Figures represent TOTAL
except when otherwise noted

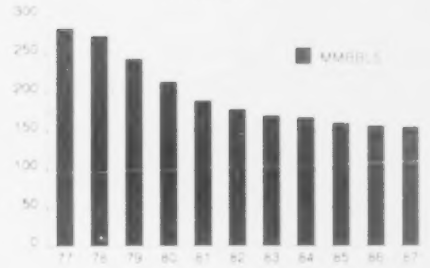
Totals may not add due to rounding

Indicator	1983	1984	1985	1986	1987	87.4	88.1	88.2	Jul	Aug	Sept	Year to Date Through Last Month Reported Sept 1987	Year to Date Through Last Month Reported Sept 1988	% Change
EXPLORATORY WELLS - LA.* (As reported)														
Oil	66	59	62	34	20	4	4	4	6	0	0	16	14	-12.5%
Gas	97	82	100	63	56	12	15	6	3	3	1	44	29	-34.1%
Dry	821	704	665	423	350	97	105	83	50	42	23	253	303	19.8%
DEVELOPMENTAL WELLS - LA.* (As reported)														
Oil	1950	2361	2712	1604	901	209	182	214	91	57	43	692	587	-15.2%
Gas	1011	992	1145	768	462	163	139	143	40	49	37	299	408	36.5%
Dry	1219	1453	1433	1000	666	199	207	207	78	67	64	467	623	33.4%
WELL COMPLETIONS - LA.* (As reported)														
North	2878	3667	4038	2209	1106	344	228	254	97	94	78	762	751	-1.4%
South	1193	1248	1325	1036	740	175	222	165	65	62	43	565	557	-1.4%
Offshore (Incl. fed. water)	1094	736	754	628	598	165	202	239	106	62	47	433	656	51.5%
WELL COMPLETIONS - SUCCESS RATIO														
North	69.5	68.1	70.5	62.1	64.6	62.4	56.3	59.9	61.9	56.4	48.7	65.3	57.3	-12.3%
South	45.1	47.2	52.8	51.7	58.7	62.0	53.7	49.6	52.3	51.6	55.8	57.6	52.2	-9.4%
Offshore (Incl. fed. water)	51.9	57.5	58.1	56.2	50.9	45.5	46.4	50.4	43.4	38.7	40.4	52.7	45.9	-12.9%
RUNNING RIGS (Avg. Hughes Tool)														
North	29	30	25	12	12	13	11	13	13	16	19	11	13	18.2%
South	128	147	129	63	59	73	74	65	59	55	49	54	65	20.4%
Offshore (Includes Fed. OCS)	125	132	129	69	65	83	90	90	92	84	79	59	88	49.2%
DRILLING PERMITS ISSUED														
Exploratory	645	702	599	298	284	93	56	65	21	16	22	191	180	-5.8%
Developmental	4849	6929	4811	1983	2148	584	388	511	137	145	160	1564	1341	-14.3%
Total	5494	7631	5410	2281	2432	677	444	576	158	161	182	1755	1521	-13.3%

*Source: Petroleum Information Corporation. CES maintains additional data in the Indicators Database.

Production

LA CRUDE OIL PRODUCTION



CRUDE OIL STOCKS

AVERAGE END OF MONTH

LOUISIANA ELECTRICITY GENERATION

BY FUEL TYPE - SEPT 1988

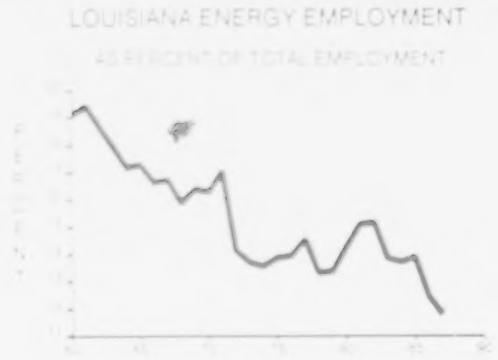
Figures represent TOTAL
except when otherwise noted

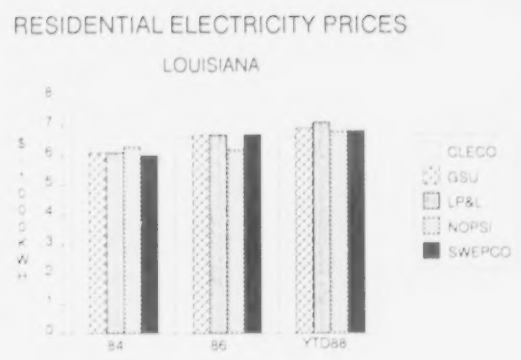
Totals may not add due to rounding

Indicator	1983	1984	1985	1986	1987	87.4	88.1	88.2	Jul	Aug	Sept	Year to Date Through Last Month Reported Sept 1987	Year to Date Through Last Month Reported Sept 1988	% Change
CRUDE OIL PRODUCTION - Lease Condensate Included (Avg. MBBLS/day)														
North	93.8	90.7	87.6	80.5	76.7	79.5	75.8	73.6	72.1	73.0	73.3	75.8	74.1	-2.2%
South	332.9	348.0	350.2	345.9	328.0	316.4	320.4	313.2	302.0	322.1	292.5	338.8	313.1	-7.6%
Offshore	67.7	74.2	70.0	71.4	66.6	60.9	70.6	70.1	69.1	65.8	53.5	68.4	67.8	-0.9%
Total	494.3	512.9	507.8	497.8	471.3	456.8	466.8	456.9	443.2	460.9	419.3	476.1	455.0	-4.4%
CRUDE OIL PRODUCING WELLS														
North	16299	17544	18792	19346	18630	18383	18106	18053	17926	17968	17601	18712	17997	-3.8%
South	6374	6241	6278	6117	5897	5861	5815	5711	5850	5764	5705	5909	5766	-2.4%
Offshore	1037	1030	996	1000	963	975	1003	976	971	948	951	959	978	2.0%
Total	23710	24815	26066	26463	25490	25219	24923	24740	24747	24680	24257	25580	24742	-3.3%
CRUDE OIL STOCK - E.O.M. Avg. (MMBBLS)	13.3	13.4	13.4	13.4	14.0	14.1	16.5	14.4	13.8	14.6	15.3	13.9	15.2	9.4%
COAL-LIGNITE PRODUCTION (Thousand Short Tons)	NC	NC	NC	2254	2774	668	706	808	222	233	250	2106	2211	5.0%
REFINERY RUNS (Avg.MBBLS/day)	1633.1	1746.0	1736.5	1901.5	1931.4	2038.3	2030.8	1804.0	1918.9	1941.6	1921.1	1895.7	1920.6	1.3%
ELECTRICITY GENERATED (GWH)*														
Gas	28311	29360	27735	26035	23823	5998	5110	6258	3205	3220	2334	17825	20127	12.9%
Coal	8377	9830	13968	15587	15101	4544	4565	4670	1503	1724	1676	10557	14138	33.9%
Oil	356	140	100	419	60	14	149	9	22	16	29	46	225	389.1%
Nuclear Power	0	0	2458	10638	12324	2126	3963	2591	1407	1361	1156	10198	10478	2.7%
Total	37044	39330	44261	52679	51308	12682	13788	13528	6137	6321	5194	38626	44967	16.4%
ELECTRICITY CONSUMPTION (GWH)*														
Residential	17371	18550	19176	19865	19802	3885	4379	6977	2357	2400	2220	15917	15675	-1.5%
Commercial	10008	10941	11576	12533	12650	2947	3128	3898	1281	1296	1321	9703	9896	2.0%
Industrial	23836	25900	24067	21202	23064	5961	5808	5914	1868	1987	2059	17103	17438	2.0%
Other	4072	4247	3993	3899	3610	750	756	858	272	266	320	2860	2318	-19.0%
Total	55287	59638	58812	57499	59126	13543	14071	17646	5778	5949	5919	45583	45326	-0.6%

*1GWH = 1 MILLION KWH
NC = Not Collected

Employment, Prices & Revenues





Figures represent TOTAL
except when otherwise noted

Totals may not add due to rounding

Indicator	1983	1984	1985	1986	1987	87.4	88.1	88.2	Jul	Aug	Sep	Year to Date Through Last Month Reported Sept 1987	Year to Date Through Last Month Reported Sept 1988	% Change
EMPLOYMENT (Thousands) - Avg.														
Oil & Gas Extraction (SIC13)	88.0	75.6	77.1	61.9	55.8	55.9	52.1	52.1	52.4	52.2	52.1	55.8	52.1	-6.6%
Chemicals & Allied Products (SIC28)	30.9	28.9	28.0	26.1	25.2	25.3	25.4	25.7	25.8	25.9	26.0	25.2	25.7	2.0%
Petroleum Refining (SIC29)	12.4	11.6	11.1	11.5	11.6	11.7	11.4	11.4	11.4	11.5	11.4	11.5	11.4	-0.9%
Total La. Employment	1657.0	1751.9	1744.2	1727.3	1728.7	1765.4	1673.3	1701.4	1738.5	1731.0	1736.8	1716.5	1703.4	-0.8%
OIL PRICES ($/BBL) - Avg.														
Wellhead														
LA	30.02	29.67	27.22	15.32	17.98	17.97	16.05	16.55	14.87	14.68	14.09	17.98	15.72	-12.6%
US	26.19	25.88	24.09	12.51	15.42	15.23	13.34	13.86	12.36	12.20	11.61	15.48	13.08	-15.5%
Spot (Avg. End of Week)														
W. Texas Int. - Cushing	NC	NC	NC	14.47**	18.80	18.81	16.69	16.88	16.30	15.20	13.35	19.24	16.17	-16.0%
Louisiana - St. James	NC	NC	NC	14.56**	10.51	19.16	16.96	16.82	16.44	15.45	13.27	17.59	16.26	-7.6%
RESIDENTIAL ELECTRICITY PRICES														
(Avg. $ at 1000 kwh)														
CLECO	7.4	7.6	7.3	6.6	6.8	6.6	6.3	6.7	6.5	6.6	6.7	6.9	6.6	-4.3%
GSU	6.2	6.1	7.6	6.7	6.8	7.3	6.6	7.1	6.8	7.0	6.9	6.6	6.9	4.5%
LP&L	5.7	6.1	5.9	6.7	7.0	6.6	7.2	7.4	7.5	7.3	7.5	7.0	7.1	1.4%
NOPSI	5.9	6.3	5.9	6.2	6.3	6.3	6.5	6.9	6.9	7.0	7.1	6.2	6.8	9.7%
SWEPCO	5.7	6.0	6.6	6.7	6.6	6.6	6.5	7.0	6.9	6.8	6.8	6.6	6.8	3.0%
COAL PRICES ($/Short Ton)														
(Avg.LA Elec.Util.Receipt Price)	38.83	37.40	37.06	29.21	26.81	26.67	25.07	24.30	26.98	24.96	26.61	26.86	25.18	-6.3%

NA = Not available from source
NC = Not collected
NR = Not reported
p = Preliminary
** 7 month average

Historical Presentation - Annual

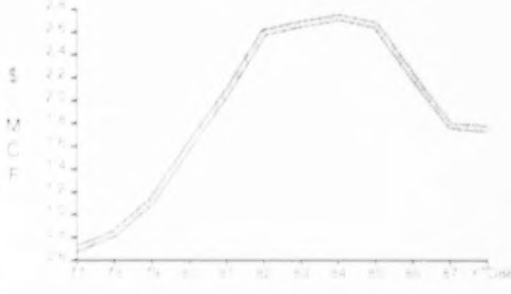
NATURAL GAS PRODUCTION

LA SEVERANCE TAX (NAT. GAS)

AS % OF TOTAL REVENUE

LOUISIANA WELLHEAD PRICE

NATURAL GAS



Figures represent TOTAL except when otherwise noted

Totals may not add due to rounding

Indicator	77	78	79	80	81	82	83	84	85	86	87	YTD88.3
PRINCIPAL ENERGY RELATED REVENUES (Millions $) (Calendar Year)												
Sev. - Oil & Condensate	262.1	264.5	276.6	427.9	815.3	776.8	664.1	653.5	598.3	390.3	345.6	242.8
Sev. - Natural Gas	207.2	196.1	187.0	162.0	164.2	147.5	132.7	131.3	121.1	126.1	112.7	81.1
Bonuses	28.0	105.6	110.1	118.4	141.6	59.3	47.0	68.0	32.1	15.9	25.5	9.1
Rentals	13.6	8.5	22.2	31.6	46.4	53.7	27.7	21.2	20.9	12.3	6.7	3.2
Royalties	165.1	170.1	194.4	252.6	414.7	482.7	444.9	436.1	379.1	304.5	253.8	125.9
Special Fuels Tax	17.3	20.1	22.2	22.9	24.7	25.5	27.1	41.1	52.3	57.6	55.2	43.2
Gasoline Tax	161.6	170.1	156.6	161.4	165.6	162.3	161.0	227.7	286.2	289.5	311.6	239.1
Nat. Gas Franchise Tax	4.6	4.9	4.8	6.3	7.8	9.6	12.5	11.7	11.0	10.9	9.3	7.4
Total Energy Revenues	860.9	941.4	975.4	1184.7	1782.3	1719.4	1519.5	1592.6	1502.9	1211.6	1126.4	554.8
TOTAL STATE REVENUES (Millions $)	1908.6	2265.2	2564.8	3046.9	3462.3	3969.3	3775.0	3785.2	4335.6	3913.2	3783.6	2156.3
ENERGY RELATED REVENUES AS % OF STATE TOTAL	45.1	41.6	38.0	38.9	51.5	43.3	40.3	42.1	34.7	31.0	29.8	25.7

Indicator	77	78	79	80	81	82	83	84	85	86	87	YTD88.3
GAS PRICES ($/MCF)-Avg. Wellhead												
LA	0.70	0.84	1.12	1.61	2.07	2.60	2.67	2.73	2.66	2.21	1.78	1.75*
US	0.79	0.91	1.18	1.59	1.98	2.46	2.59	2.66	2.51	1.94	1.67	1.70
NATURAL GAS PRODUCTION - Casinghead Included (Avg. MMCF/day)												
North	945.8	908.9	979.2	1007.3	1135.8	1032.5	997.3	1047.8	959.8	994.9	976.5	1012.0
South	6789.3	6235.5	5845.4	5275.3	4921.0	4195.5	3624.8	3758.8	3477.0	3303.0	3199.0	3199.0
Offshore	1325.9	1340.6	1309.4	1118.1	1025.7	984.0	870.6	830.7	696.2	675.1	624.7	626.2
Total	9024.4	8484.9	8134.0	7400.7	7082.5	6211.9	5492.6	5637.3	5132.9	4972.9	4800.2	4837.2
NATURAL GAS PRODUCING WELLS (Avg. #-EOY)												
North	6343	6917	7372	8360	9479	10154	10502	10812	11026	11049	10726	10800
South	1408	3244	3214	3277	3226	3136	3065	2955	2976	2698	2670	2557
Offshore	449	473	514	551	557	564	549	532	511	438	413	440
Total	8200	10634	11100	12188	13262	13854	14116	14299	14513	14185	13809	13797

Continued from front

short-term impacts on production and use are minimized by making a revenue neutral adjustment from volume to value.

Administration of a ValueTax

The administration of a natural gas value tax relates to the precise method of taxation. One method is to levy a flat rate, such as 4.5 percent on the value of natural gas at the wellhead. This procedure requires (1) identifying the selling price, and (2) estimating transmission, marketing, and processing costs.

While simple in concept, this procedure may prove complicated in practice. However, royalty payments to private mineral owners and the state are based on value at the wellhead and are calculated regularly. Therefore, companies do have experience with the value concept. Since the emergence of short-term contracts for natural gas, the spot market, and numerous broker transactions, states with a value tax have experienced complications in its collection procedures. The value method does impose certain administrative costs.

An alternative method to a value approach is to index the volume tax to a measure of the rate of change of the price of natural gas. The volume tax would rise from the current 7 cents per MCF to 8 or 9 cents depending on what is happening to the price of natural gas. Indexing depends on selecting a reliable and representative natural gas price or a reasonable proxy.

Indexing Prices

During the October Special Session, the Roemer Administration supported a natural gas index based on the producer price index for gas fuels. The price index is collected, tabulated, and reported by the U.S. Department of Labor, Bureau of Labor Statistics. Indexing requires the acceptance of at least two assumptions: (1) that all natural gas prices rise and fall in accordance with the index and (2) that the selected national index accurately portrays the natural gas markets in Louisiana. These assumptions are reasonable in an unregulated market; however, in a regulated market environment, the national index may not correlate closely with the Louisiana gas markets.

The advantage of indexing is that the tax is volume related, though the tax rate increases with the value of the resource. Indexation is now used in Florida but can work for large gas producing states as well.

Conclusion

The bottom line is that the state should tax natural gas on a value basis and in doing so should minimize impacts on: (1) short and long-term production and consumption activities and (2) administrative complications. By changing the tax to value, making it revenue-neutral in the initial stages, and utilizing an indexing of the tax rate as opposed to defining the wellhead value of natural gas as the tax base, the above can be accomplished.

SOURCES OF INDICATOR DATA PUBLICATIONS

Consumer Price Index. U.S. Dept. of Labor. Bureau of Labor Statistics. Monthly.
Price Indexes

Electric Power Monthly. U.S. Dept. of Energy. Energy Information Administration.
Electricity Production and Consumption Data

Employment and Total Wages Paid by Employers Subject to the Louisiana Employment Security Law. Louisiana Dept. of Labor. Office of Management and Finance. Research and Statistics Unit. Quarterly.
Wages, Number of Establishments, Employment Data

Louisiana Climatological Data. U.S. Dept. of Commerce. National Weather Service. Monthly.
Heating and Cooling Degree Days (Not in this issue)

Louisiana Petroleum Activity Report. Monthly.
Drilling, Rig Activity, Oil and Gas Production, Refinery Runs and Stocks Data

Monthly Energy Review. U.S. Dept. of Energy. Energy Information Administration. Monthly.
Crude Oil Prices

Monthly Motor Fuel Reported by States. U.S. Dept. of Transportation. Monthly.
Federal Highway Administration Gasoline Consumption - U.S.

Natural Gas Monthly. U.S. Dept. of Energy. Energy Information Administration.
Interstate Natural Gas Price Data
Wellhead Price of Natural Gas - U.S.

Production Data

Oil & Gas Journal. Penn Well Publishing Company. Tulsa, Oklahoma.
Gasoline Prices.

Petroleum Marketing Monthly. Dept. of Energy. Energy Information Administration. Office of Oil & Gas.
Wellhead Price of Crude Oil

Survey of Current Business. U.S. Dept. of Commerce. Bureau of Economic Analysis. Monthly.
Gross National Product
Consumer Price Index

World Oil. Gulf Publishing Company. Houston, Texas.
Wells Drilled, Wells Completed

OTHER SOURCES

Hughes Tool Company
Rig Activity

Louisiana Department of Natural Resources. Office of Conservation.

Louisiana Department of Revenue and Taxation. Statement of Net Collections and Distributions. (Mimeograph)
Taxes and Revenues

Louisiana Public Service Commission. (Mimeograph)
Electricity Data
Intrastate Natural Gas Prices

Petroleum Information Corporation (Unpublished data.)
Wells Completed
Wells Abandoned

CES is seeking appropriate articles for this publication. Contact Roberta Scull, (504) 388-4400.

Center for Energy Studies
One E. Fraternity Circle
Louisiana State University
Baton Rouge, LA 70803-0301

Non-Profit Org.
U.S. Postage
PAID
Permit #733
Baton Rouge, LA

Louisiana Energy Indicators is published quarterly by the Center for Energy Studies, Louisiana State University, One E. Fraternity Circle, Baton Rouge, LA 70803-0301, (504) 388-4400. For address corrections, please return mailing label to CES with changes. For continued receipt of this and other CES publications, notify Barbara Kavanaugh at the CES address.

LSU/CES 88E-03

BEST AVAILABLE COPY

Address Correction Requested

U2730-1
5-1-89

Louisiana Energy Indicators

Center for Energy Studies
Louisiana State University

Winter 1989

National Energy Strategy Developed

Lori Cameron
Project Director
South/West Energy Council National Energy Strategy

In 1988, because of the vital relationship between energy, the economy and the long-term security of this nation, a group of energy state legislators known as the South/West Energy Council undertook a project to develop a national energy strategy.

This group, consisting of legislators from Alabama, Louisiana, Arkansas, Oklahoma, Texas, New Mexico, Colorado and Alaska, sought to identify the guiding principles that assure the U.S. will have energy to move its people, produce its products and maintain critical communications.

The 99-page background paper resulting from the project presents a series of recommendations and observances relative to energy conservation, crude oil, coal, natural gas, renewable energy and electricity.

The overall goal of the council's national energy strategy is to provide a stable supply of reasonably-priced energy in an *efficient* and *environmentally sound* manner to meet the needs of U.S. citizens, the economy and national security interests. The council feels the long-term goal of the U.S. should be energy independence.

First, it is clear that a policy which relies solely on domestic energy production simply can't live up to its promise. This nation now sends four billion dollars a *month* abroad for oil. We're heading quickly for a 50 percent dependence level on foreign crude.

Crude Oil

Relative to crude oil, a three point policy approach emerged: conservation, domestic production, and import management. Essential to an American energy policy is a strong domestic energy industry. The council believes the U.S. should support domestic oil and gas exploration with tax incentives, just as it supports oil and gas recovery to assure maximum recovery of those resources already identified.

Energy conservation is key. Not only does it make economic sense to use our energy resources efficiently, but it makes environmental sense as well.

The council proposes the U.S. continue to promote energy conservation, improving efficiency by setting or strengthening: Corporate Average Fuel Efficiency Standards for automobiles; energy efficiency provisions in buildings; home appliance, heating and cooling unit efficiency standards; and waste recycling or reduction standards for industrial manufacturing. Basic energy conservation research, on topics like superconductivity, needs to be funded.

The third point with regard to crude oil is the management of imports--common sense tactics to lessen dependency, such as encouraging a Pan American Energy Alliance, opening a dialogue with suppliers worldwide and continuing to fill the Strategic Petroleum Reserve.

It is also the recommended policy of the council to pursue active management of federal lands and Outer Continental Shelf areas in accordance with principles of multiple use. One of every three acres in this country belongs to the federal government. Federal lands, particularly those in Alaska, hold great promise for the environmentally sound development of energy resources.

Along with these relatively short-term policies dealing with conservation and crude oil, *the council favors developing a combination of other fuels and technologies to meet America's long-term goal of energy independence.*

Natural Gas

Natural gas is another extremely important component of the council's energy mix. This domestic resource is more plentiful than recently thought. Most important, it is clean burning and efficient.

The council recommends promoting the domestic production and use of natural gas and pursuing the development of natural gas-fueled vehicles.

Coal

Coal, America's leading fuel in terms of reserves, holds the promise of long-term energy security. But, today its use is constrained by aged technology and environmental problems, concerns which are being addressed by the Clean Coal Technology Program funded by federal and private dollars. The Clean Coal Technology Program is supported wholeheartedly in the National Energy Strategy.

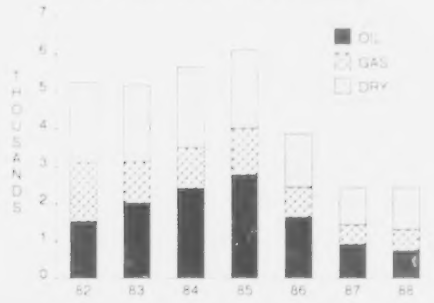
Renewable Energy Sources

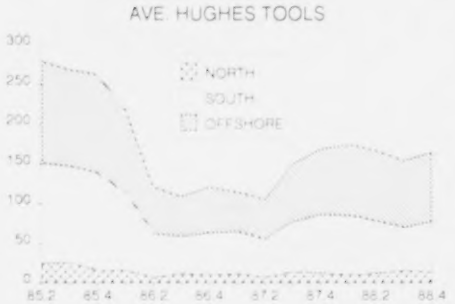
The council also recognizes that renewable energy sources need a long-term, stable program to research, develop, demonstrate and commercialize the most promising of these resources.

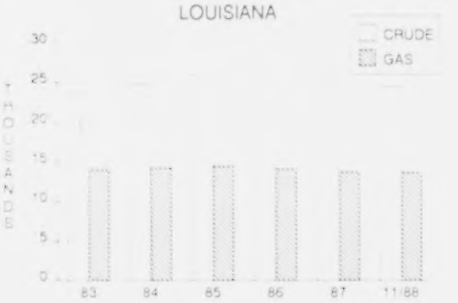
In addition to research, development, demonstration and commercialization of energy sources, there are a number of energy technologies that require

Continued on back page

Drilling







Figures represent TOTAL
except when otherwise noted

Totals may not add due to rounding

Indicator	1983	1984	1985	1986	1987	88.1	88.2	88.3	Oct	Nov	Dec	Year to Date Through Last Month Reported Dec 1987	Dec 1988	% Change
OIL WELLS COMPLETED*														
North	1393	1792	2139	1092	426	71	86	90	20	44	22	426	333	-21.8%
South	305	389	420	349	321	79	59	55	9	8	23	321	233	-27.4%
Offshore (Includes Fed OCS)	319	239	215	197	174	36	73	52	5	4	15	174	185	6.3%
Total	2017	2420	2774	1638	921	186	218	197	34	56	60	921	751	-18.5%
GAS WELLS COMPLETED*														
North	588	680	721	426	282	55	70	61	18	19	35	282	258	-8.5%
South	234	190	281	214	113	40	26	35	10	7	15	113	133	17.7%
Offshore (Includes Fed OCS)	286	204	243	172	122	59	54	37	2	1	12	122	165	35.2%
Total	1108	1074	1245	812	517	154	150	133	30	27	62	517	556	7.5%
DRY WELLS COMPLETED*														
North	897	1195	1178	691	398	102	98	118	34	32	43	398	427	7.3%
South	654	669	624	473	306	103	80	80	18	15	27	306	323	5.6%
Offshore (Includes Fed OCS)	489	293	296	259	302	107	112	126	20	14	30	302	409	35.4%
Total	2040	2157	2098	1423	1006	312	290	324	72	61	100	1006	1159	15.2%
PRODUCING WELLS (Avg)														
Crude Oil	23710	24815	26066	26469	25490	24923	24740	24527	24362	24480	NA	25490	NA	--
Natural Gas	14116	14299	14513	14185	13809	13764	13830	13796	13793	13723	NA	13809	NA	--
Total	37826	39114	40579	40654	39299	38687	38570	38323	38155	38203	NA	39299	NA	--
RUNNING RIGS (Avg. Hughes Tool)														
North	29	30	25	12	12	11	13	16	15	16	16	12	14	16.7%
South	128	147	129	63	59	74	65	54	52	54	38	59	63	6.8%
Offshore (Includes Fed OCS)	125	132	129	69	65	90	90	85	81	88	90	65	88	35.4%

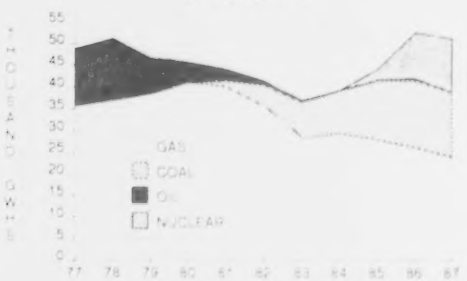
*Source: Petroleum Information Corporation. CES maintains additional data in the Indicators Database.

Production

NATURAL GAS PRODUCTION

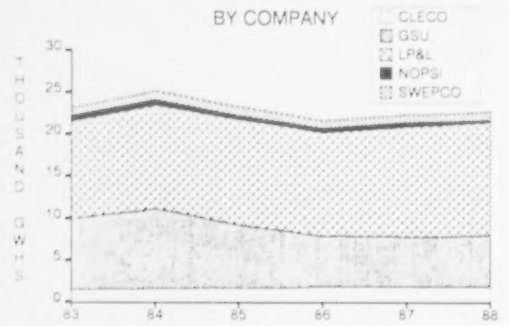
ELECTRICITY GENERATION

BY FUEL TYPE



TOTAL INDUSTRIAL ELECTRIC SALES

BY COMPANY



Figures represent TOTAL
except when otherwise noted

Totals may not add due to rounding

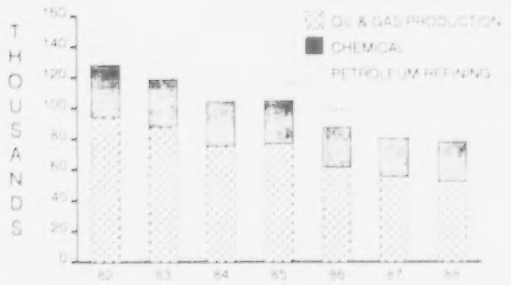
Indicator	1983	1984	1985	1986	1987	88.1	88.2	88.3	Oct	Nov	Dec	Year to Date Through Last Month Reported Dec 1987	Dec 1988	% Change
NATURAL GAS PRODUCTION - Lease Condensate Included (Avg. MMCF/day)														
North	1.00	1.05	0.96	0.99	0.98	1.04	0.99	1.02	1.02	1.05	NA	0.98	NA	--
South	3.64	3.76	3.48	3.30	3.20	3.23	3.16	3.22	3.27	3.31	NA	3.20	NA	--
Offshore	0.87	0.83	0.70	0.68	0.62	0.66	0.62	0.55	0.56	0.54	NA	0.62	NA	--
Total	5.49	5.64	5.13	4.97	4.80	4.93	4.77	4.79	4.85	4.91	NA	4.80	NA	--
MOTOR VEHICLE FUEL CONSUMPTION (Millions of Gallons)														
Gasoline														
LA	2151	2142	1949	1824	1810	468	498	516	161	165	178	1810	1985	9.7%
ELECTRICITY GENERATED (GWH)*														
Gas	28311	29360	27735	26035	23823	5110	6258	8759	1466	1484	NA	23823	NA	--
Coal	8377	9830	13968	15587	15101	4565	4670	4903	1561	990	NA	15101	NA	--
Oil	356	140	100	419	60	149	9	67	1	11	NA	60	NA	--
Nuclear Power	0	0	2458	10638	12324	3963	2591	3924	903	1005	NA	12324	NA	--
Total	37044	39330	44261	52679	51308	13788	13528	17652	3931	3489	NA	51308	NA	--
ELECTRICITY CONSUMPTION (GWH)*														
Residential	17371	18550	19176	19865	19802	4319	4379	6977	1674	1190	NA	19802	NA	--
Commercial	10008	10941	11576	12533	12650	2870	3128	3898	1162	1010	NA	12650	NA	--
Industrial	23836	25900	24067	21202	23064	5716	5808	5914	2109	1946	NA	23064	NA	--
Other	4072	4247	3993	3899	3610	704	756	858	364	923	NA	3610	NA	--
Total	55287	59638	58812	57499	59126	13609	14071	17646	5308	4438	NA	59126	NA	--
INDUSTRIAL ELECTRICITY SALES (GWH)*														
CLECO	1462.9	1600.8	1663.6	1780.5	1788.7	431.7	456.4	473.1	161.2	146.3	163.2	1788.7	1831.9	2.4%
GSU	8530.7	9583.2	7468.7	6063.9	5996.6	1508.2	1480.4	1612.8	553.0	533.6	531.9	5996.6	6219.9	3.7%
LP&L	11490.5	12167.5	12468.2	12341.0	13102.4	3270.8	3336.9	3260.5	1209.1	1209.1	1111.2	13102.4	13397.6	2.3%
NOPSI	727.9	670.0	495.9	452.1	527.4	102.4	113.9	123.2	36.9	36.9	31.2	527.4	339.5	-35.6%
SWEPCO	1013.9	1085.4	1123.3	1048.0	1044.5	245.8	260.9	281.5	90.2	90.2	82.3	1044.5	1050.9	0.6%

*1GWH = 1 MILLION KWH

Employment, Prices & Revenues

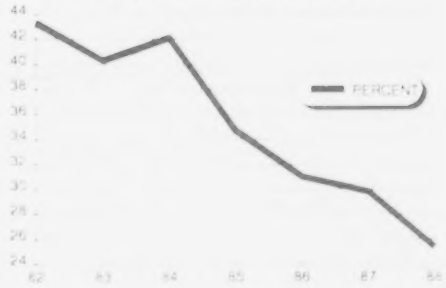
ENERGY RELATED EMPLOYMENT

LOUISIANA

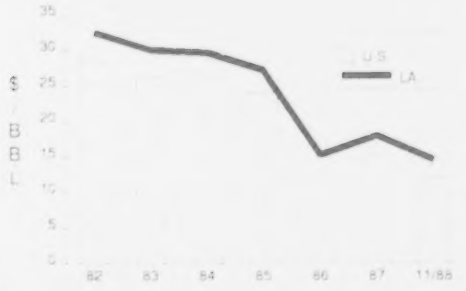


LA. ENERGY REVENUES AS

PERCENT OF TOTAL REVENUES



AVERAGE WELLHEAD PRICE OF OIL

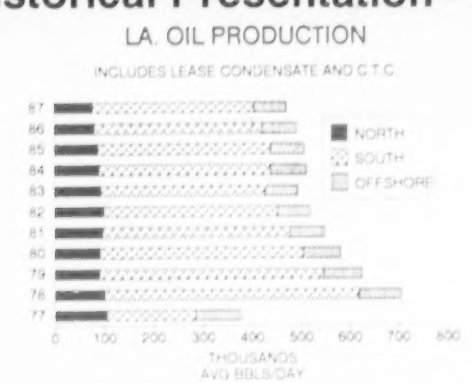


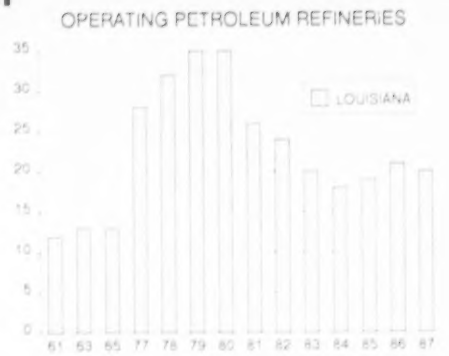
Figures represent TOTAL
except when otherwise noted

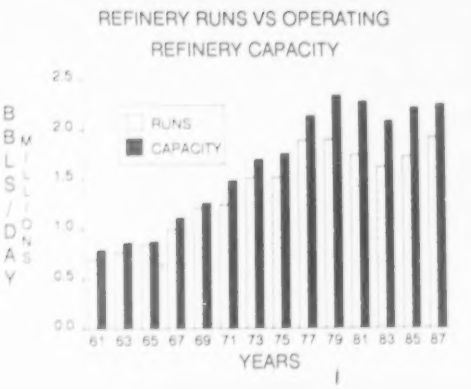
Totals may not add due to rounding

Indicator	1983	1984	1985	1986	1987	88.1	88.2	88.3	Oct	Nov	Dec	Year to Date Through Last Month Reported Dec 1987	Dec 1988	% Change
EMPLOYMENT (Thousands) - Avg.														
Oil & Gas Extraction (SIC13)	88.0	75.6	77.1	61.9	55.4	52.5	52.1	52.2	51.8	51.7	54.1	55.4	52.4	-5.4%
Chemicals & Allied Products (SIC28)	30.9	28.9	28.0	26.1	25.3	25.8	25.7	25.9	26.0	26.1	27.1	25.3	25.9	2.4%
Petroleum Refining (SIC29)	12.4	11.6	11.1	11.5	11.5	11.1	11.4	11.4	11.5	11.4	10.2	11.5	11.2	-2.6%
Total La. Employment	1657.0	1751.9	1744.2	1727.3	1726.7	1669.3	1701.4	1735.4	1760.0	1744.2	1689.5	1726.7	1709.3	-1.0%
OIL PRICES ($/BBL) - Avg.														
Wellhead														
LA	30.02	29.67	27.22	15.29	17.98	16.05	16.55	14.55	13.12	12.77	NA	17.97	NA	--
US	26.19	25.88	24.09	12.45	15.42	13.34	13.86	12.06	10.60	10.30	NA	15.42	NA	--
Spot (Avg. End of Week)														
W. Texas Int. - Cushing	30.21	29.33	27.87	13.39	18.68	16.68	16.88	14.95	13.60	15.30	17.25	19.03	15.98	-16.0%
Louisiana - St. James	30.63	29.64	28.42	13.49	11.69	16.89	16.82	15.05	13.60	15.70	17.92	17.67	16.13	-8.7%
PRINCIPAL ENERGY RELATED REVENUES (Millions $) (Calendar Year)														
Sev. - Oil & Condensate	664.1	653.5	598.3	390.3	345.6	103.0	68.0	71.7	17.4	17.1	22.8	345.6	300.0	-13.2%
Sev. - Natural Gas	132.7	131.3	121.1	126.1	112.7	30.1	25.0	26.0	7.7	8.0	9.5	112.7	106.4	-5.6%
Bonuses	47.0	68.0	32.1	15.9	25.5	6.5	2.5	3.9	0.6	1.6	2.6	25.5	17.7	-30.6%
Rentals	27.7	21.2	20.9	12.3	6.7	2.1	1.2	3.4	0.6	1.4	0.7	6.7	9.3	38.8%
Royalties	444.9	436.1	379.1	304.5	253.8	61.7	64.2	57.0	15.1	16.2	29.1	253.8	243.2	-4.2%
Special Fuels Tax	27.1	41.1	52.3	57.6	55.2	13.4	14.9	14.9	5.5	4.9	4.5	55.2	58.0	5.1%
Gasoline Tax	161.0	227.7	286.2	289.5	311.6	75.3	80.1	83.8	26.5	25.2	24.0	311.6	314.7	1.0%
Nat. Gas Franchise Tax	12.5	11.7	11.0	10.9	9.3	2.4	2.6	2.4	1.1	- 1.3	0.0	9.3	9.7	4.3%
Total Energy Revenues	1519.5	1592.6	1502.9	1211.6	1126.4	295.5	259.3	263.9	75.0	75.6	93.3	1126.4	1062.6	-5.7%
TOTAL STATE REVENUES (Millions $)	**3775.0**	**3785.2**	**4335.6**	**3913.2**	**3783.6**	**887.0**	**1269.3**	**983.2**	**354.2**	**317.8**	**370.4**	**3783.6**	**4181.8**	**10.5%**
ENERGY RELATED REVENUES AS % OF STATE TOTAL	**40.3**	**42.1**	**34.7**	**31.0**	**29.8**	**33.3**	**20.4**	**26.8**	**21.2**	**23.8**	**25.2**	**29.8**	**25.4**	**-14.6%**

Historical Presentation - Annual







Figures represent TOTAL
except when otherwise noted

Totals may not add due to rounding

Indicator	77	78	79	80	81	82	83	84	85	86	87	88
CRUDE OIL PRODUCTION - Lease Condensate Included (AVG MBBLS/DAY)												11/88
North	105.4	100.7	91.0	91.6	97.6	99.6	93.8	90.7	87.6	80.5	76.7	72.2
South	179.7	517.2	454.5	414.1	379.7	353.4	332.9	348.0	350.2	340.3	328.0	311.6
Offshore	92.7	88.8	80.4	75.4	71.9	67.3	67.7	74.3	70.0	71.4	66.6	65.0
Total	377.8	706.7	625.9	581.1	549.2	520.3	494.4	513.0	507.8	492.2	471.3	448.8
REFINERY RUNS (AVG MBBLS/DAY)												YTD88.3
LA	1890.7	1857.2	1905.5	1781.2	1747.4	1702.9	1633.1	1745.9	1736.5	1901.5	1931.4	1920.6
CRUDE STOCKS (AVG MBBLS/DAY)												YTD88.3
LA	13978.2	13509.8	13525.9	16403.7	14253.6	12584.2	13313.9	13371.8	13439.6	13391.3	13967.4	15159.5

Indicator	77	78	79	80	81	82	83	84	85	86	87	88
OPERABLE PETROLEUM REFINERIES - LA												
Operating	28	32	NA	35	26	24	20	18	19	21	20	NA
Idle	0	0	NA	0	8	3	4	3	2	2	3	NA
Total	28	32	35	35	35	27	24	21	21	23	23	NA
CAPACITY OF OPERABLE PETROLEUM REFINERIES - LA (MBBLS/DAY)												
Operating	2140.1	2201.2	NA	2456.1	2287.5	2115.4	2094.7	2147.4	2226.5	2243.3	2262.2	NA
Idle	15.5	6.6	NA	0.0	219.4	455.8	150.9	101.6	57.0	62.4	359.0	NA
Total	2185.6	2237.8	2349.5	2456.1	2506.9	2571.2	2245.6	2249.0	2283.5	2305.7	2621.2	NA
EMPLOYMENT (Thousands) - Avg. Petroleum Refining (SIC29)	10.7	11.6	12.6	13.3	16.3	13.2	12.4	11.6	11.1	11.5	11.5	11.2

Continued from front

similar attention. For instance, cogeneration is extremely efficient when powered by natural gas. It can be adapted to renewable fuels as well.

Energy storage system technologies would improve efficiencies by leveling out peak energy demand periods. However, superconductivity is the most enticing technological prospect from an efficiency point of view. The National Energy Strategy recommends that work on these technologies be pursued as a cooperative effort among industry, higher education and the national laboratories.

Electricity

Although not an energy source, electricity is also addressed in the South/West Council's energy strategy. The council urges that regulation of electric power companies with regard to questions like fuel choice, rates and system reliability be maintained at the state level, where the regulators are closer to the consuming public.

Further, the council specifically addressed two important points regarding nuclear power. First, that a federally acceptable, standardized power plant design be established and second, that a federal program for storage and disposal of spent nuclear fuel be finalized as quickly as is safely possible.

Implementation

In the final section of its National Energy Strategy entitled "Implementation," the council notes that the development of environmentally sound energy conservation, supply and distribution systems require long-range planning and sustained effort.

This National Energy Strategy is a starting point for federal consideration. The council does not expect it to be accepted in its entirety, but hopes only to provide a foundation for intelligent debate.

The National Energy Strategy has already received a favorable review in a Feb. 20 editorial by John H. Jennrich of "Natural Gas Week."

Jennrich noted that the council's call for energy independence is not a "man-the-barricades cry for dramatic but impractical solutions," but rather a management plan that maximizes American resources.

He also described the council's report as being "a bit conservative in estimating the longevity of the social and economic needs for a clean, domestic and readily available fuel (natural gas)," but says its conservatism is a major part of its appeal.

Finally, the South/West Energy Council embarked upon the National Energy Strategy project because of the perceived void in federal energy policy.

This grass roots effort, based in large part upon the environmentally sound production of domestic resources, energy conservation and common sense management of imports can only help the states, be they producers or consumers.

Lori Cameron is an attorney with Adams & Reese of Baton Rouge. She is a specialist in energy and environmental policy.

SOURCES OF INDICATOR DATA PUBLICATIONS

Consumer Price Index. U.S. Dept. of Labor. Bureau of Labor Statistics. Monthly.
Price Indexes

Electric Power Monthly. U.S. Dept. of Energy. Energy Information Administration.
Electricity Production and Consumption Data

Employment and Total Wages Paid by Employers Subject to the Louisiana Employment Security Law. Louisiana Dept. of Labor. Office of Management and Finance Research and Statistics Unit. Quarterly.
Wages. Number of Establishments. Employment Data

Louisiana Climatological Data. U.S. Dept. of Commerce. National Weather Service. Monthly.
Heating and Cooling Degree Days (Not in this issue)

Louisiana Petroleum Activity Report, Monthly.
Drilling. Rig Activity. Oil and Gas Production. Refinery Runs and Stocks Data

Monthly Energy Review. U.S. Dept. of Energy. Energy Information Administration. Monthly.
Crude Oil Prices.

Monthly Motor Fuel Reported by States. U.S. Dept. of Transportation. Monthly.
Federal Highway Administration Gasoline Consumption - U.S.

Natural Gas Monthly. U.S. Dept. of Energy. Energy Information Administration.
Interstate Natural Gas Price Data
Wellhead Price of Natural Gas - U.S.
Production Data

Oil & Gas Journal. Penn Well Publishing Company. Tulsa, Oklahoma.
Gasoline Prices.

Petroleum Marketing Monthly. Dept. of Energy. Energy Information Administration. Office of Oil & Gas.
Wellhead Price of Crude Oil

Survey of Current Business. U.S. Dept. of Commerce. Bureau of Economic Analysis. Monthly.
Gross National Product
Consumer Price Index

World Oil. Gulf Publishing Company. Houston, Texas.
Wells Drilled; Wells Completed

OTHER SOURCES

Hughes Tool Company
Rig Activity

Louisiana Department of Natural Resources. Office of Conservation.

Louisiana Department of Revenue and Taxation. Statement of Net Collections and Distributions. (Mimeograph)
Taxes and Revenues

Louisiana Public Service Commission. (Mimeograph)
Electricity Data
Intrastate Natural Gas Prices

Petroleum Information Corporation (Unpublished data.)
Wells Completed
Wells Abandoned

CES is seeking appropriate articles for this publication. Contact Roberta Scull, (504) 388-4400.

Center for Energy Studies
One E. Fraternity Circle
Louisiana State University
Baton Rouge, LA 70803-0301

Non-Profit Org.
U.S. Postage
PAID
Permit #733
Baton Rouge, LA

Louisiana Energy Indicators is published quarterly by the Center for Energy Studies, Louisiana State University, One E. Fraternity Circle, Baton Rouge, LA 70803-0301, (504) 388-4400. For address corrections, please return mailing label to CES with changes. For continued receipt of this and other CES publications, notify Barbara Kavanaugh at the CES address.

LSU/CES 89E-01

Address Correction Requested

U2730-1

Louisiana Energy Indicators

Center for Energy Studies

Louisiana State University

Spring 1989

RADIOACTIVE SCALE IN PETROLEUM PRODUCTION EQUIPMENT AND PIPE

L. Max Scott, PhD.
Radiation Safety Office
Louisiana State University

Scale formation in petroleum production equipment has been a costly problem since the beginning of the oil industry. Scale, a secondary deposit of mainly inorganic chemical compounds caused by the presence or flow of fluids in a system, restricts production, causes inefficiency in equipment, impedes heat transfer and is time consuming to remove.

The scale problem costs the petroleum companies over a billion dollars each year.

Recently, another problem with the scale has been recognized--radioactivity. In 1981, the United Kingdom discovered in the North Sea area that naturally occurring radioactive material (NORM) found in the earth's crust tends to be chemically concentrated in the scale. The dominant radioactive element is radium-226.

In the United States, recognition of this hazard has surfaced in the past three years.

In Mississippi, playground equipment constructed from oil field piping had to be removed when above background gamma radiation readings were discovered. Similar incidents have occurred in Louisiana and southeastern Kansas.

The cleaning of scaled equipment has also resulted in land contamination with radium-226 and its radioactive daughters.

Although awareness of the hazards of radioactive scale is fairly recent, the oil industry has been aware of associated natural radioactivity with petroleum production since the early 1930s. Recognition of higher radon levels in some soils near oil production areas also existed then.

In fact, a correlation was attempted using radon concentration in the soil as an indicator for the presence of oil. This methodology for finding oil did not work, but the use of radioactivity in natural shales, sandstones and clays help the petroleum geologist determine where possible oil strikes are located through gamma ray well logging.

It is believed that the source of the radium is from its leaching out of the surrounding uranium-containing rock.

Infiltration into the brine could be through dissolution, diffusion or alpha recoil (the energy imparted a nucleus after ejection of the alpha). But leaching seems to be the most probable method, since the radium can be easily extracted leaving the mineral intact.

Environmental Concerns

Presently, the full extent of the environmental effects of radium-containing scale and brine are unknown. In 1978, the EPA proposed that any industrial by-product that contains greater than 5 pCi/gram of radium-226 should be classified as hazardous waste, but this rule was never promulgated.

Then, in 1988, the EPA stated that wastes such as produced water, sand, drilling muds and cuttings were not to be classified as hazardous waste.

This year, however, the Louisiana Department of Environmental Quality (DEQ) declared that "environmental contamination by and human exposure to technologically enhanced concentrations of naturally occurring radioactive materials, such as have been identified recently in the oil and gas industry, present a number of serious health concerns."

Restrictions added to the Louisiana regulations are:

(1) Land is not to be transferred for unrestricted use if it has a concentration over background of radium-226 of 5 pCi/gram averaged over the first 15 centimeters of soil below the surface and 15 pCi/gram averaged over the next 15 centimeters of soil below the surface. This will be averaged over any 100 square meters of land.

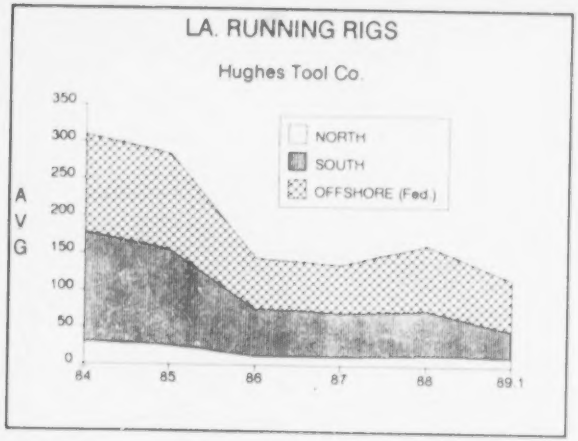
(2) Equipment and facilities contaminated with radium-226 in excess of the acceptable levels shall not be released for unrestricted use. Maintenance and decontamination of this equipment must be done under a general license or have authorization by the division.

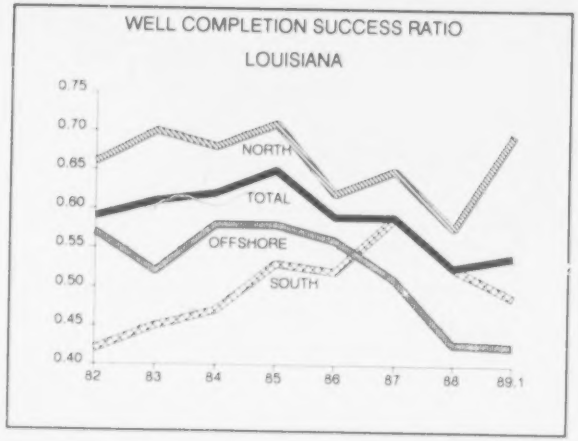
(3) Radioactivity measurements using test methods approved by the Office of Water Resources shall be performed on existing produced water discharges through August 20, 1989, for the determination of the potential environmental impact.

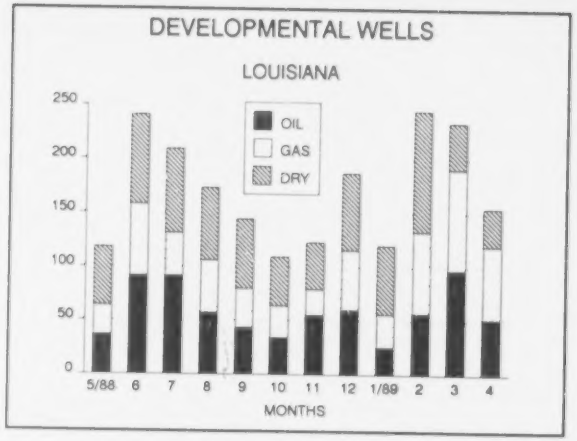
Disposal of this low-level radioactive waste in the United States can be difficult and costly (as much as $150 per cubic foot, if a site will accept it at all). In the United Kingdom, however, where scale regulations are derived from standards set by the International Commission on Radiological Protection, some scale and

Continued on back page

Drilling







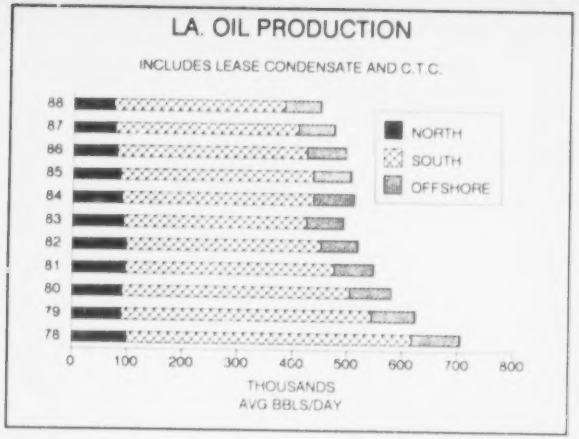
Figures represent TOTAL
except when otherwise noted

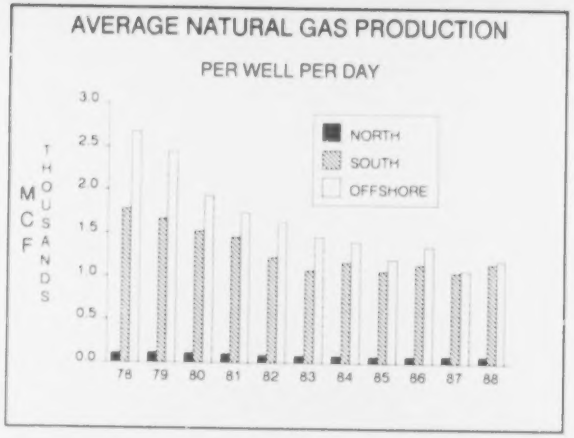
Totals may not add due to rounding

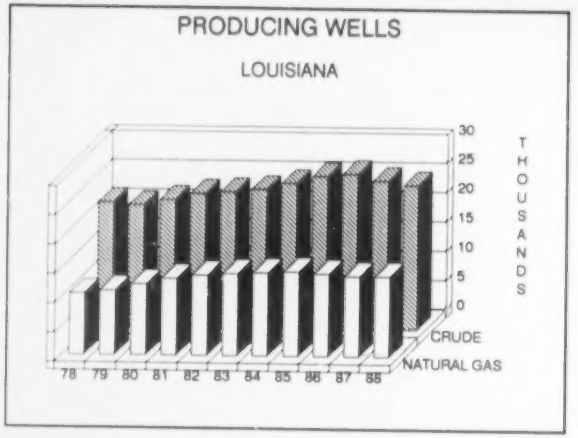
Indicator	1984	1985	1986	1987	1988	88.2	88.3	88.4	Jan	Feb	Mar	Year to Date Through Last Month Reported March 1988	Year to Date Through Last Month Reported March 1989	% Change
EXPLORATORY WELLS - LA.* (As reported)														
Oil	59	62	34	20	15	4	6	1	2	2	2	4	6	50.0%
Gas	82	100	63	56	38	7	7	9	2	7	8	15	17	13.3%
Dry	704	665	423	350	376	83	115	73	35	51	15	105	101	-3.8%
DEVELOPMENTAL WELLS - LA.* (As reported)														
Oil	2361	2712	1604	901	736	214	191	149	25	57	97	182	179	-1.6%
Gas	992	1145	768	462	518	143	126	110	31	76	94	139	201	44.6%
Dry	1453	1433	1000	666	783	207	209	160	64	112	43	207	219	5.8%
Total	4806	5290	3372	2029	2037	564	526	419	120	245	234	528	599	13.4%
WELL COMPLETIONS - LA.* (As reported)														
North	3667	4038	2209	1106	1018	254	269	267	51	99	79	228	229	0.4%
South	1248	1325	1036	740	689	165	170	132	39	78	41	222	158	-28.8%
Offshore (Incl. fed. water)	736	754	628	598	759	239	215	103	69	128	139	202	336	66.3%
WELL COMPLETIONS - LA. SUCCESS RATIO														
North	68.1	70.5	62.1	64.6	57.6	59.9	55.7	58.7	56.9	68.7	83.5	56.3	69.7	23.8%
South	47.2	52.1	51.7	58.7	52.5	49.6	53.2	53.3	53.8	46.2	46.3	53.7	48.8	-9.1%
Offshore (Includes Fed. OCS)	57.5	58.1	56.2	50.9	42.7	50.4	40.8	33.2	14.5	29.7	83.5	46.4	42.5	-8.4%
Total	61.8	65.1	58.9	59.1	52.6	54.7	50.2	53.2	37.7	46.6	77.6	52.4	54.0	3.1%
RUNNING RIGS (Avg. Hughes Tool)														
North	30	25	12	12	14	13	16	16	14	14	12	11	13	18.2%
South	147	129	63	59	61	65	54	48	36	33	37	74	35	-52.7%
Offshore (Incl. fed. water)	132	129	69	65	88	90	85	86	79	66	61	90	69	-23.3%

*Source: Petroleum Information Corporation. CES maintains additional data in the Indicators Database.

Production







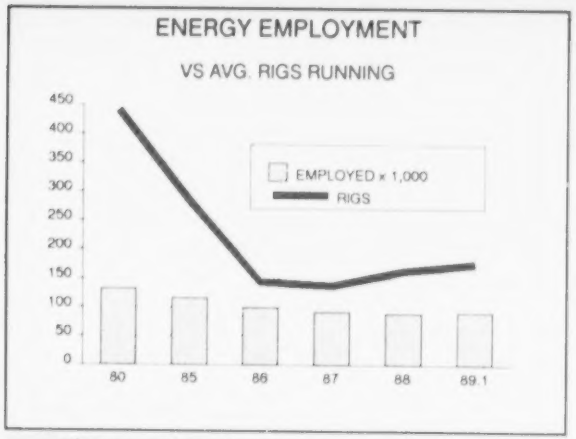
Figures represent TOTAL
except when otherwise noted

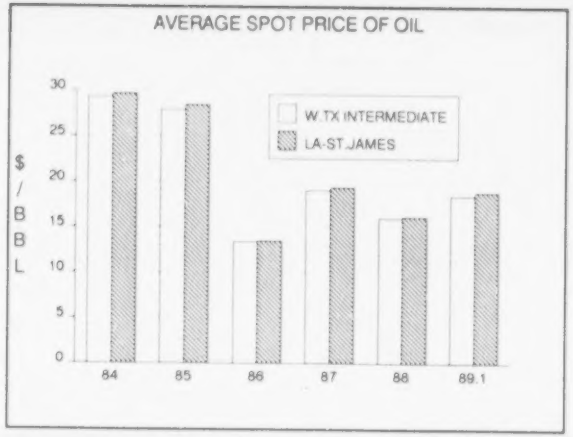
Totals may not add due to rounding

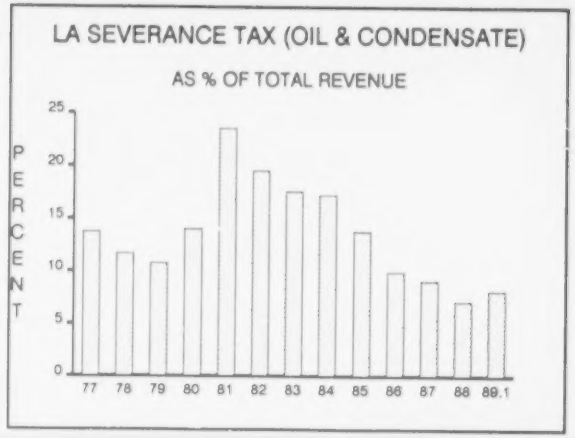
Indicator	1984	1985	1986	1987	1988	88.2	88.3	88.4	Jan	Feb	Mar	Year to Date Through Last Month Reported March 1988	Year to Date Through Last Month Reported March 1989	% Change
CRUDE OIL PRODUCING WELLS														
North	17544	18792	19346	18630	17953	18053	17832	17823	17133	NA	NA	18106	NA	--
South	6241	6278	6117	5897	5711	5711	5747	5569	5664	NA	NA	5815	NA	--
Offshore	1030	996	1000	963	969	976	948	948	968	NA	NA	1003	NA	--
Total	24815	26066	26300	25415	24633	24740	24527	24340	23765	NA	NA	24923	NA	--
NATURAL GAS PRODUCING WELLS														
North	10812	11026	11049	10726	10813	10801	10825	10850	10914	NA	NA	10775	NA	--
South	2955	2976	2747	2670	2539	2581	2532	2486	2491	NA	NA	2557	NA	--
Offshore	532	511	438	413	445	448	439	461	478	NA	NA	432	NA	--
Total	14299	14513	14185	13809	13796	13830	13796	13796	13883	NA	NA	13764	NA	--
CRUDE OIL PRODUCTION - Lease Condensate Included (Avg. MBBLS/day)														
North	90.7	87.6	80.5	76.7	73.7	73.6	72.8	72.4	70.6	NA	NA	75.8	NA	--
South	348.0	350.2	345.9	333.7	311.0	313.2	305.5	304.9	309.3	NA	NA	320.4	NA	--
Offshore	74.2	70.0	71.4	66.6	67.2	70.1	62.8	65.3	63.1	NA	NA	70.6	NA	--
Total	512.9	507.8	492.0	469.3	451.9	456.9	441.1	442.6	443.0	NA	NA	466.8	NA	--
NATURAL GAS PRODUCTION - Casinghead Included (Avg. BCF/day)														
North	1.05	0.96	0.99	0.97	1.02	0.99	1.02	1.04	1.07	NA	NA	1.04	NA	--
South	3.76	3.48	3.36	3.68	3.23	3.16	3.22	3.29	3.25	NA	NA	3.23	NA	--
Offshore	0.83	0.70	0.68	0.61	0.59	0.62	0.55	0.55	0.53	NA	NA	0.66	NA	--
Total	5.64	5.13	4.97	4.81	4.84	4.77	4.79	4.88	4.85	NA	NA	4.93	NA	--
COAL-LIGNITE PRODUCTION (Thousand Short Tons)	NR	NR	2254	2774	2889	823	705	488	242	206	237	683	685	0.3%

NR = Not Reported
NA = Not Available From Source (Office of Conservation, Department of Natural Resources) As of 6/16/89

Employment, Prices & Revenue





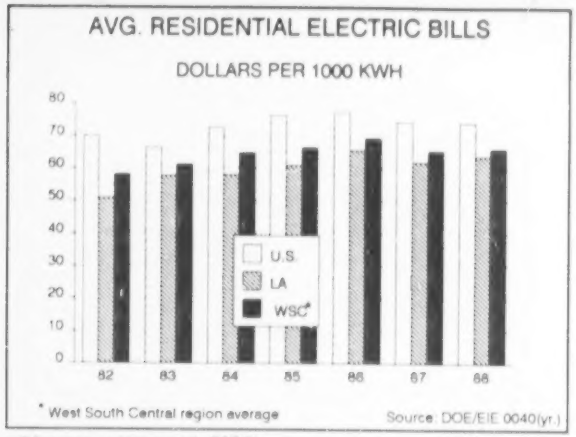


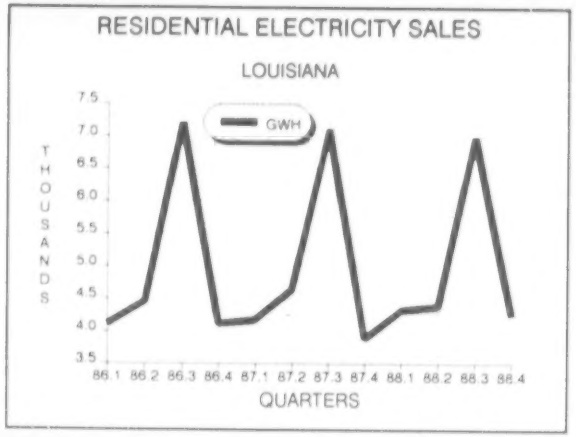
Figures represent TOTAL
except when otherwise noted

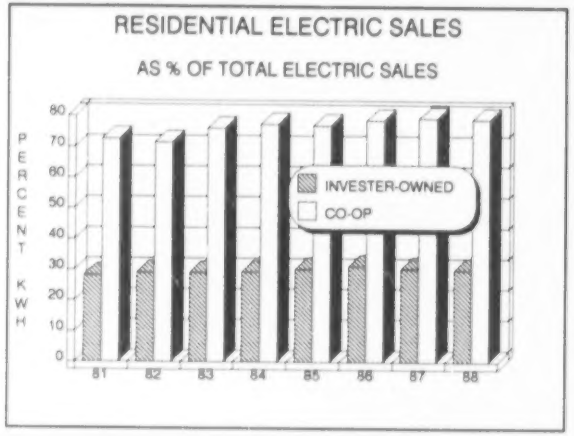
Totals may not add due to rounding

Indicator	1984	1985	1986	1987	1988	88.2	88.3	88.4	Jan	Feb	Mar	Year to Date Through Last Month Reported March 1988	Year to Date Through Last Month Reported March 1989	% Change
EMPLOYMENT (Thousands) - Avg.														
Oil & Gas Extraction (SIC13)	75.6	77.1	61.9	55.8	52.6	52.1	52.2	52.5	54.7	54.2	54.3	53.6	54.4	1.5%
Chemicals & Allied Products (SIC28)	28.9	28.0	26.1	25.2	26.1	25.7	25.9	26.4	27.3	27.2	27.4	26.5	27.3	3.0%
Petroleum Refining (SIC29)	11.6	11.1	11.5	11.6	11.1	11.4	11.4	11.0	10.2	10.2	10.1	10.4	10.2	-1.9%
Total La. Employment	1751.9	1744.2	1727.3	1728.7	1712.5	1701.4	1735.4	1731.2	1663.9	1655.2	1707.9	1681.8	1675.7	-0.4%
OIL PRICES ($/BBL) - Avg.														
Wellhead														
LA	29.67	27.22	15.29	17.98	15.18	16.55	14.55	12.95	16.63	16.73	18.25	16.06	17.20	7.1%
US	25.88	24.09	12.45	15.42	12.55	13.83	12.06	10.96	13.79	14.21	15.63	13.33	14.54	9.1%
Spot (Avg. End of Week)														
W. Texas Int. - Cushing	29.33	27.87	13.39	19.03	15.98	16.88	14.95	15.38	17.05	18.15	20.20	16.68	18.47	10.7%
Louisiana - St. James	29.64	28.42	13.49	19.38	16.13	16.82	15.05	15.74	17.55	18.15	20.90	16.89	18.87	11.7%
PRINCIPAL ENERGY RELATED REVENUES (Millions $)														
Sev. - Oil & Condensate	653.5	598.3	390.3	345.6	300.0	68.0	71.7	57.3	23.0	32.3	25.1	103.0	80.3	-22.0%
Sev. - Natural Gas	131.3	121.1	126.1	112.7	106.4	25.0	26.0	25.2	10.3	11.8	9.9	30.1	31.9	6.0%
Bonuses	68.0	32.1	15.9	25.5	17.7	2.5	3.9	4.8	0.6	1.4	0.2	6.5	2.2	-66.2%
Rentals	21.2	20.9	12.3	6.7	9.3	1.2	3.4	2.7	0.5	0.8	0.6	2.1	1.9	-9.5%
Royalties	436.1	379.1	304.5	253.8	243.2	64.2	57.0	60.4	15.4	17.5	19.4	61.7	52.2	-15.4%
Special Fuels Tax	41.1	52.3	57.6	55.2	58.0	14.9	14.9	14.9	5.4	4.4	3.9	13.4	13.8	3.0%
Gasoline Tax	227.7	286.2	289.5	311.6	314.7	80.1	83.8	75.6	28.2	23.2	24.6	75.3	76.0	0.9%
Nat. Gas Franchise Tax	11.7	11.0	10.9	9.3	9.7	2.6	2.4	2.3	0.7	1.6	0.1	2.4	2.4	0.0%
Total Energy Revenues	1592.6	1502.9	1211.6	1126.4	1062.6	259.3	263.9	244.0	84.6	93.1	83.9	295.5	261.6	-11.5%
TOTAL STATE REVENUES (Millions $)	3785.2	4335.6	3913.2	3783.6	4181.8	1269.3	983.2	1042.3	358.8	307.2	317.4	887.0	983.4	10.9%
ENERGY RELATED REVENUES AS % OF STATE TOTAL	42.1	34.7	31.0	29.8	25.4	20.4	26.8	23.4	23.6	30.3	26.4	33.3	26.6	-20.2%

Historical Presentation - Electricity







Figures represent TOTAL
except when otherwise noted

Totals may not add due to rounding

Indicator	86.2	86.3	86.4	87.1	87.2	87.3	87.4	88.1	88.2	88.3	88.4	89.1
RESIDENTIAL ELECTRICITY PRICES (Avg. $ at 1000kwh)												
Investor Owned												
CLECO	65	63	70	67	71	68	66	63	67	66	66	64
GSU	71	66	63	56	72	69	73	66	71	69	70	69
LP&L	68	69	65	69	70	72	70	66	72	74	74	71
NOPSI	64	61	63	60	62	65	63	65	69	70	71	69
SWEPCO	70	69	66	63	67	67	66	65	70	68	68	64
Co-operatives												
Beauregard	102	99	97	98	97	91	87	80	87	80	83	78
Bossier	107	103	102	103	102	96	97	95	95	87	92	93
Concordia	110	103	110	103	105	95	98	98	92	88	93	93
Dixie	103	99	98	99	100	94	93	92	91	84	87	88
Pointe Coupee	102	99	102	101	102	93	96	95	94	85	90	92
Valley	109	102	106	104	104	98	98	97	96	88	93	94
Washington	95	93	90	91	88	82	79	79	79	69	72	75

Indicator	86.2	86.3	86.4	87.1	87.2	87.3	87.4	88.1	88.2	88.3	88.4	89.1
RESIDENTIAL SALES (KWH) AS % OF TOTAL SALES (KWH)												
Investor Owned												
CLECO	36.2	45.9	37.3	38.6	39.0	45.0	34.1	39.0	38.1	44.8	35.0	38.0
GSU	23.5	31.5	25.4	23.8	25.2	31.7	22.1	24.0	23.8	30.7	22.7	22.1
LP&L	26.8	35.7	27.0	26.6	26.9	33.6	22.9	26.0	25.1	33.6	24.5	24.6
NOPSI	33.4	44.5	35.2	32.0	34.1	43.8	32.3	31.8	32.1	41.7	32.6	30.3
SWEPCO	36.4	45.7	34.7	36.6	38.0	45.7	35.0	37.4	36.2	45.4	35.6	36.9
Co-operatives												
Beauregard	79.5	84.3	80.2	81.7	79.9	83.7	79.3	81.7	79.3	83.3	80.4	82.2
Bossier	73.4	80.4	77.0	76.2	74.7	83.7	73.4	75.9	73.9	81.0	75.4	76.5
Concordia	65.2	74.1	64.0	68.9	64.7	70.1	56.4	61.5	61.7	70.0	57.8	63.8
Dixie	80.5	84.8	81.3	82.8	80.7	84.2	80.0	82.8	79.8	84.0	82.0	82.0
Pointe Coupee	57.3	66.0	60.3	60.0	59.7	68.7	58.8	60.8	60.9	69.8	60.9	61.4
Valley	76.2	83.1	76.7	80.9	79.7	85.0	77.8	82.5	79.4	84.4	77.7	81.6
Washington	78.7	78.9	79.9	81.9	80.2	80.9	79.8	80.7	75.0	81.0	78.8	79.9

Continued from front

produced water is permitted for disposal in the ocean, which already contains small quantities of these natural radioactive elements.

Conclusions of an LSU study

Recently, an LSU graduate student, Adrianne J. Wilson, completed a thesis on various radiological hazards associated with radioactive scaling by examining material from a retired pipe-reaming (a scale cleaning method) yard. Her conclusions are as follows:

(1) Higher exposure rates are associated in an area where this practice exists due to radium-226 and its daughters in the scale waste. The exposure rates in this case were high enough to possibly exceed the recommended limit for non-radiological workers.

(2) High concentrations of radium-226 were found in the soil composition classifying it as "hazardous" under the new DEQ proposal.

(3) A correlation between the concentration of radium-226 in the topsoil and the gamma exposure rate was seen.

(4) The radon emanation rate was significantly lower than expected. This is believed to be due to the high solubility of radon in petroleum products.

(5) The leaching of the radium-226 will be negligible in most environments which is an important consideration for landfill disposal.

Assuming the yard under study is representative, we must conclude that some radiological hazards do exist from radioactive scaling.

In yards and or fields with low activity soil, the soil can possibly be mixed or dispersed with other soils. Yards and or fields with high concentrations of radium-226 should be restricted for use and probably cleaned up.

Prevention of scaling, if possible, is desirable, of course. But when scale does form the waste should be contained, rather than being allowed to contaminate land.

For personnel working directly with radioactive scale, normal radiological practices should be followed, i.e. the wearing of respiratory protection masks, restrictions on eating, drinking and smoking and the necessity of good personal hygiene. Most important is employee knowledge of the hazards associated with radioactive scale.

Further evaluation of soil containing radioactive scale is required. Presently, DEQ is performing an extensive study of it in hopes of determining the exact magnitude of the problem and precise methods for handling it.

Dr. L. Max Scott holds a Ph.D. in Genetics and Statistics from Purdue University and presently serves as the LSU Radiation Safety Officer. He was recently designated a fellow of the Health Physics Society.

SOURCES OF INDICATOR DATA PUBLICATIONS

Consumer Price Index. U.S. Dept. of Labor. Bureau of Labor Statistics. Monthly.
Price Indexes.

Electric Power Monthly. U.S. Dept. of Energy. Energy Information Administration.
Electricity Production and Consumption Data

Employment and Total Wages Paid by Employers Subject to the Louisiana Employment Security Law. Louisiana Dept. of Labor. Office of Management and Finance Research and Statistics Unit. Quarterly.
Wages, Number of Establishments, Employment Data

Louisiana Climatological Data. U.S. Dept. of Commerce. National Weather Service. Monthly.
Heating and Cooling Degree Days (Not in this issue)

Louisiana Petroleum Activity Report. Monthly.
Drilling, Rig Activity, Oil and Gas Production, Refinery Runs and Stocks Data

Monthly Energy Review. U.S. Dept. of Energy. Energy Information Administration. Monthly.
Crude Oil Prices.

Monthly Motor Fuel Reported by States. U.S. Dept. of Transportation. Monthly.
Federal Highway Administration Gasoline Consumption - U.S.

Natural Gas Monthly. U.S. Dept. of Energy. Energy Information Administration.
Interstate Natural Gas Price Data
Wellhead Price of Natural Gas - U.S.

Production Data

Oil & Gas Journal. Penn Well Publishing Company. Tulsa, Oklahoma.
Gasoline Prices.

Petroleum Marketing Monthly. Dept. of Energy. Energy Information Administration. Office of Oil & Gas.
Wellhead Price of Crude Oil

Survey of Current Business. U.S. Dept. of Commerce. Bureau of Economic Analysis. Monthly.
Gross National Product
Consumer Price Index

World Oil. Gulf Publishing Company. Houston, Texas.
Wells Drilled; Wells Completed

OTHER SOURCES

Hughes Tool Company
Rig Activity

Louisiana Department of Natural Resources. Office of Conservation.

Louisiana Department of Revenue and Taxation. Statement of Net Collections and Distributions. (Mimeograph)
Taxes and Revenues

Louisiana Public Service Commission. (Mimeograph)
Electricity Data
Intrastate Natural Gas Prices

Petroleum Information Corporation (Unpublished data.)
Wells Completed
Wells Abandoned

CES is seeking appropriate articles for this publication. Contact Roberta Scull, (504) 388-4400.

Center for Energy Studies
One E. Fraternity Circle
Louisiana State University
Baton Rouge, LA 70803-0301

Louisiana Energy Indicators is published quarterly by the Center for Energy Studies, Louisiana State University, One E. Fraternity Circle, Baton Rouge, LA 70803-0301, (504) 388-4400. For address corrections, please return mailing label to CES with changes. For continued receipt of this and other CES publications, notify Barbara Kavanaugh at the CES address.

LSU/CES 89E-02

Non-Profit Org.
U.S. Postage
PAID
Permit #733
Baton Rouge, LA

Address Correction Requested